CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 78-20

NPDES NO. CA0005550

WASTE DISCHARGE REQUIREMENTS FOR:

EXXON COMPANY, USA
BENICIA REFINERY
SOLANO COUNTY, CALIFORNIA

The California Regional Water Quality Control Board, San Francisco Bay Region hereinafter Board, finds that:

1. Exxon Company, USA, Benicia Refinery, hereinafter discharger, manufactures gasoline and other hydrocarbon fuels by the cracking subcategory of refinery processes. The Benicia Refinery has a 100,000 barrel per stream day crude-run capacity, and discharges these wastes containing pollutants:

   a. Waste 001 is process waste, cooling waste and boiler blowdown, storm water from process areas, and tank ballast. These treated wastes are discharged into Suisun Bay, a navigable water of the United States, at a depth of about 16 feet approximately 1500 feet offshore, west of the Suisun Reserve Fleet Anchorage, via a 12 inch diameter outfall with diffuser ports. The average discharge rate is 2.4 mgd and the maximum rate is 5.8 mgd.

   b. Wastes 002 through 006 are storm water runoff from areas not used for processing or storing petroleum or products, and are discharged without treatment at these points:

      (1) Along the western boundary of the discharger's wastewater treatment site, via several ditches tributary to a storm drainage canal which flows along the east side of the processing area and enters Suisun Bay via a tide gate near the discharger's wastewater treatment plant (002).

      (2) Near the water service entrance box at the north end of Avenue "A" in the refinery, in the northwest corner of the processing area, via a culvert that discharges into a ditch tributary to the drainage canal and thence Suisun Bay as described above (003).

      (3) Near the southeast corner of the processing area, via a culvert that discharges into a ditch tributary to the drainage canal and thence Suisun Bay as described above (004).

      (4) Near the discharger's Gate No. 4, on the south side of the processing area, via a culvert that discharges into a ditch tributary to the drainage canal and thence Suisun Bay as described above (005).

(5) Near the northern corner of the discharger's crude oil tankage site, via a ditch that discharges into the drainage canal and thence Suisun Bay as described above (006).

2. On November 19, 1974, the Board issued Order No. 74-146 prescribing waste discharge requirements for the discharger.

3. The Board adopted a Water Quality Control Plan for the San Francisco Bay Basin in April 1975.

4. The benificial uses of Suisun Bay and Carquinez Strait are:

a. Recreation
b. Fish migration and habitat
c. Habitat and resting for waterfowl and migratory birds
d. Industrial & agricultural water supply
e. Esthetic enjoyment
f. Navigation

5. Effluent limitation and toxic effluent standards, established pursuant to Sections 208(b), 301, 304, and 307 of the Federal Water Pollution Control Act and amendments thereto are applicable to the discharge.

6. The Board has notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

7. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

8. This Order shall serve as a National Pollutant Discharge Elimination System permit pursuant to Section 402 of the Federal Water Pollution Control Act, or amendments thereto, and shall take effect at the end of ten days from date of hearing provided the Regional Administrator, U. S. Environmental Protection Agency, has no objections.

9. This project involves the continued operation of a privately-owned facility with negligible or no expansion of use beyond that previously existing. Consequently, this project will not have a significant effect on the environment based upon the exemption provided in Section 15101, Title 14, California Water Code.

IT IS HEREBY ORDERED that the discharger in order to meet the conditions listed in 3, 4, and 5 above shall comply with the following:

A. Effluent Limitations

1. The discharge of Waste 001 containing constituents in excess of the following is prohibited:

Constituent	Unit	30-Day Average	Maximum Daily
BOD_5	lbs/day	1130	2034
	kg/day	513	923
Total Suspended Solids	lbs/day	904	1417
	kg/day	410	643
COD	lbs/day	7888	15,200
	kg/day	3578	6895
Oil & Grease	lbs/day	329	616
	kg/day	149	279
	mg/l	-	15
Phenolic Compounds	lbs/day	7.39	15.2
	kg/day	3.35	6.89
Ammonia as N	lbs/day	616	1356
	kg/day	279	615
Total Sulfide	lbs/day	5.96	13.4
	kg/day	2.70	6.08
Total Chromium	lbs/day	18.1	30.8
	kg/day	8.21	14.0
Hexavalent Chromium	lbs/day	1.15	2.46
	kg/day	0.52	1.12
Settleable Solids	ml/l/hr	0.1	0.5
Zinc	lbs/day	6.00	10.0
	kg/day	2.72	4.54

2. The following allocations attributable to runoff and ballast which is treated and discharged as part of Waste 001 shall be added to the effluent limitations specified in Section A1 for these four pollutants to determine their total effluent limitations. The allocations below shall be calculated by the method specified in the Self-Monitoring Program.

ADDITIONAL POUNDS (KILOGRAMS) OF POLLUTANT PER THOUSAND GALLONS OF FLOW TREATED AND DISCHARGED AS PART OF WASTE 001

POLLUTANT	STORM RUNOFF 30-Day Average	STORM RUNOFF Maximum Daily	BALLAST 30-Day Average	BALLAST Maximum Daily
5-day, 20°C BOD	0.21 (.0953)	0.40 (.181)	0.21 (.0953)	0.40 (.181)
Total suspended solids	0.17 (0.0771)	0.26 (0.118)	0.17 (0.0771)	0.26 (0.118)
Chemical oxygen demand	1.6 (.726)	3.1 (1.41)	2.0 (.907)	3.9 (1.77)
Oil & grease	.067 (.0304)	.126 (.0572)	.067 (.0304)	.126 (.0572)

3. Waste 001 shall not have a pH of less than 6.0 nor greater than 9.0.

4. The survival of test fishes in 96-hour bioassays of the effluent shall be a 90 percentile value of not less than 50 percent survival.

5. The temperature of Waste 001 shall not exceed 85°F or 20°F more than the natural temperature of Suisun Bay.

6. Wastes 002, 003, 004, 005, and 006 shall not contain total organic carbon in excess of 35 mg/l or oil and grease in excess of 15 mg/l at any time.

7. Neither the treatment nor the discharge of pollutants shall create a nuisance as defined in the California Water Code.

B. Receiving Water Limitations

1. The discharge of waste shall not cause the following conditions to exist in waters of the state at any place.

   a. Floating, suspended, or deposited macroscopic particulate matter or foam;

   b. Bottom deposits or aquatic growths;

   c. Alteration of turbidity or apparent color beyond present natural background levels;

   d. Visible, floating, suspended, or deposited oil or other products of petroleum origin;

   e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.

2. The discharge of waste shall not cause the following limits to be exceeded in waters of the State in any place within one foot of the water surface:

a.	Dissolved oxygen	7.0 mg/l minimum. Annual median - 80% saturation. When natural factors cause lesser concentration(s) than those specified above, then this discharge shall not cause further reduction in the concentration of dissolved oxygen.
b.	Dissolved sulfide	0.1 mg/l maximum
c.	pH	Variation from natural ambient pH by more than 0.2 pH units.
d.	Undissociated ammonium hydroxide as N	0.4 mg/l maximum 0.025 mg/l annual median

3. Waste discharges either individually or combined with other discharges shall not create a zone, defined by water temperatures of more than 1°F above natural receiving water temperature, which exceeds 25 percent of the cross-sectional area of Suisun Bay nor Carquinez Strait at any point.

4. No discharge shall cause a surface water temperature rise greater than 4°F above the natural temperature of the receiving waters at any time or place.

5. The discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board as required by the Federal Water Pollution Control Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal Water Pollution Control Act, or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

C. Provisions

1. Order No. 74-146 of this Board is hereby rescinded.

2. This Order include the attached "Reporting Requirements, Standard Provisions, and Definitions" dated April 1977 except Section B.

3. This permit may be modified, or, alternatively, revoked and reissued, to comply with any applicable effluent limitation issued pursuant to the order the United States District Court for the District of Columbia issued on June 8, 1976, in Natural Resources Defense Council, Inc. et. al. v. Russell E. Train, 8 ERC 2120 (D.D.C. 1976), if the effluent limitation so issued:

   (1) is different in conditions or more stringent than any effluent limitation in the permit; or

   (2) controls any pollutant not limited in the permit.

4. This Order expires on November 19, 1979, and the discharger must file a Report of Waste Discharge in accordance with Title 23, California Administrative Code, not later than 180 days in advance of such date as application for issuance of new waste discharge requirements.

I, Fred H. Dierker, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on March 21, 1978.

FRED H. DIERKER
Executive Officer

Attachments:
Standard Provisions, Reporting Requirement and Definitions
Self-Monitoring Program

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM
FOR

Exxon Company, USA

NPDES NO. CA 0005550

ORDER NO. 78-20

CONSISTS OF

PART A, dated January 1978

AND

PART B

PART B

I. DESCRIPTION OF SAMPLING STATIONS

A. EFFLUENT

Station	Description
E-001	At any point in the outfall from the treatment facilities for Waste 001 between the point of discharge and the point at which all waste tributary to that outfall is present.
E-002 a thru d	In the several ditches that drain from the discharger's Parcel No. 3, at the property line thereof.
E-003	At the discharger's boundary fence and in the drainage ditch flowing from the water service entrance box near the north end of Avenue "A" in the refinery.
E-004	At the mouth of a culvert, which discharges drainage from the refinery site into a ditch about 300 feet east of that site, near the eastern end of the overhead section of the 48-inch oily water sewer.
E-005	At the mouth of a culvert, which discharges into a ditch in the refinery site and about 200 feet northwest from the discharger's Gate No. 4.
E-006	In the ditch that drains the northern part of the discharger's Parcel No. 2 at a point just below the east pipeline right-of-way.

B. RECEIVING WATERS

Station	Description
C-1	An area in Suisun Bay, located at the geographic center of the diffuser system for the Waste 001 outfall, bounded by an arc connecting the locations of Stations C-2 through C-7 (see drawing No. 420 A1).

Station	Description
C-2	At a point in Suisun Bay, located on centerline of the diffuser system for the Waste 001 outfall, 35 feet shoreward from the near-shore diffuser port.
C-3	At a point in Suisun Bay, located 35 feet easterly from the centerline of the near-shore diffuser port of the Waste 001 outfall.
C-4	At a point in Suisun Bay, located 35 feet easterly from the centerline of the off-shore diffuser port of the Waste 001 outfall.
C-5	At a point in Suisun Bay, located 35 feet bayward from the offshore diffuser port of the Waste 001 outfall, and on the extended centerline of the diffuser system for said outfall.
C-6	At a point in Suisun Bay, located 35 feet westerly from the centerline of the off-shore diffuser port of the Waste 001 outfall.
C-7	At a point in Suisun Bay, located 35 feet westerly from the centerline of the near-shore diffuser port of the Waste 001 outfall.
C-8	At a point in Suisun Bay, located 100 feet from the geographic center of the diffuser system for the Waste 001 outfall on a line extended through Station C-7, norwesterly.
C-9	At a point in Suisun Bay, located 100 feet from the geographic center of the diffuser system for the Waste 001 outfall on a line extended through Station C-3, northeasterly.
C-10	At a point in Suisun Bay, located at right angles to centerline and 100 feet easterly from the geographic center of the diffuser system for Waste 001 outfall.
C-11	At a point in Suisun Bay, located 100 feet from the geographic center of the diffuser system for the Waste 001 outfall on a line extended through Station C-4, southeasterly.
C-12	At a point in Suisun Bay, located 100 feet from the geographic center of the diffuser system for the Waste 001 outfall on a line extended through Station C-6, southwesterly.
C-13	At a point in Suisun Bay, located at right angles to centerline and 100 feet westerly from the geographic center of the diffuser system for the Waste 001 outfall.

Station	Description
C-R1	At a point in Suisun Bay, located not less than 3000 feet easterly from the point of discharge from the Waste 001 outfall; in the channel adjacent to and easterly from the mothball fleet.
C-20	In each of the several ditches that convey Waste 002 from the discharger's Parcel No. 3, within ten feet downstream from the boundary fence surrounding that parcel.
C-30	In the ditch that conveys Waste 003, within ten feet downstream from the discharger's boundary fence.
C-40	In the ditch that receives Waste 004, within ten feet downstream from the mouth of the culvert that conveys the waste from the refinery.
C-50	In the ditch that receives Waste 005, within ten feet downstream from the mouth of the culvert that conveys the waste to that ditch.
C-60	This station is identical with Station E-006.
HR	Gage in the Retention Pond.
HE	Gage in the Equalization Pond.
HF	Gage in the Final Pond.
T	Tankage bunkers.

C. LAND OBSERVATIONS

Station	Description
P-1 thru P-'n'	Located at the corners and at the mid-points of each segment of the perimeter fence surrounding the Waste 001 treatment facilities, including the Equalization, Retention, and Final Ponds. (A sketch showing the location and the designations of these stations to accompany each report.)

D. MISCELLANEOUS REPORTING

1. Storm runoff treated and discharged as part of Waste 001:

   a. The million gallons of runoff (MGR) shall be calculated, for each day (0900 hrs to 0900 hrs) on which there is measurable rainfall and for not more than five days after measurable rainfall, by this formula:

   $$MGR = R(3.85) - HR(0.0718) - HE(0.0494) - HF(0.151) - VT$$

   WHERE MGR = million gallons of runoff discharged

R = inches of rainfall

VF = the change in volume of rainwater stored in diked tankage areas.

HR = change in gage height (inches), water surface of the Retention Pond.

HE = change in gage height (inches), water surface of the Equalization Pond.

HF = change in gage height (inches), water surface of the Final Pond.

(all for a 24-hour period ending at 0900 hours)

b. The 30-day average value of such runoff volume shall be 1/30 of the sum of the daily values for any consecutive 30 days.

c. Observed data and calculated values shall be shown on data pages in the format of the attached Forms "S-1", "S-2", "S-3", and "S-4".

2. Ballast water treated and discharged as part of Waste 001 shall be metered and the volume recorded for each 24-hour period ending at 0900 hours. The 30-day average values shall be 1/30 of the sum of the daily values for any consecutive 30 days. Observed data and calculated values shall be shown on data pages in the format of the attached Forms "B-1" and "B-2".

II. SCHEDULE OF SAMPLING AND ANALYSIS

A. The schedule of sampling and analysis shall be that given as Table I.

I, Fred H. Dierker, Executive Officer, do hereby certify the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Regional Board Order No. 78-20.

2. Does not include the following paragraphs of Part A:

C-3, D1, E4

3. Has been ordered by the Executive Officer on March 21, 1978, and becomes effective immediately.

4. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger and revisions will be ordered by the Executive Officer.

Attachment(s):
Tabel I (4 pages)
Notes for Table I
Runoff Allocations (Form "S-1 thru S-4")
Ballast Allocations (Form B-1 thru B-2)
Drawings (2)

FRED H. DIERKER
Executive Officer

TABLE I

SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS

Sampling Station	E-001				E-002 thru E-006		C-1 thru C-13		C-R1				
TYPE OF SAMPLE	cont	C-24	G	O	G	O	G	O	G	O			
Flow Rate (mgd)	cont	–	–	–									
BOD, 5-day, 20° C, or COD (mg/l & kg/day)	–	W	–	–									
Chlorine Residual & Dosage (mg/l & kg/day)													
Settleable Matter (ml/1-hr. & cu. ft./day)	–	–	W	–									
Total Suspended Matter (mg/l & kg/day)	–	W	–	–	E(3)								
Oil & Grease (mg/l & kg/day) (1)	–	–	W(1)	–	(1) E(2)								
Coliform (Total or Fecal) (MPN/100 ml) per req't													
Fish Toxicity, 96-hr. TL_{50} % Survival in undiluted waste	–	W	–	–									
Ammonia Nitrogen (mg/l & kg/day)	–	W	–	–									
Nitrate Nitrogen (mg/l & kg/day)													
Nitrite Nitrogen (mg/l & kg/day)													
Total Organic Nitrogen (mg/l & kg/day)													
Total Phosphate (mg/l & kg/day)													
Turbidity (Jackson Turbidity Units)													
pH (units)	Cont	–	–	–	–	–	M	–	M	–			
Dissolved Oxygen (mg/l and % Saturation)							M	–	M	–			
Temperature (°C)	Cont	–	–	–	–	–	M	–	M	–			
Apparent Color (color units)													
Secchi Disc (inches)													
Sulfides (if DO ≤ 5.0 mg/l) Total & Dissolved (mg/l)	–	–	W	–	–	–	M	–	M	–			
Arsenic (mg/l & kg/day)													
Cadmium (mg/l & kg/day)													
Chromium, Total (mg/l & kg/day)	–	M	–	–									
Copper (mg/l & kg/day)													
Cyanide (mg/l & kg/day)													
Silver (mg/l & kg/day													
Lead (mg/l & kg/day)													

TABLE I (continued)
SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS

Sampling Station	E-001				E-002 thru 006		C-1 thru C-13		C-R1				
TYPE OF SAMPLE	Cont	C-24	G	O	G	O	G	O	G	O			
Mercury (mg/l & kg/day)													
Nickel (mg/l & kg/day)													
Zinc (mg/l & kg/day)	-	M	-	-									
PHENOLIC COMPOUNDS (mg/l & kg/day)	-	W	-	-									
All Applicable Standard Observations	-	-	-	D	-	E	-	M	-	M			
Bottom Sediment Analyses and Observations							(4) 2/Y	-	(4) 2/Y	-			
Total Identifiable Chlorinated Hydrocarbons (mg/l & kg/day)													
COD (mg/l & kg/day)	-	W	-	-									
Chromium, hexavalent (mg/l & kg/day)	-	M	-	-									
Total Organic Carbon (mg/l)					E(3)	-							
Ammonia nitrogen & undissociated NH_4OH as Nitrogen (mg/l)							M(4)	-	M	-			
TDS (mg/l)							M(4)	-	M	-			

TABLE I

SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS

Sampling Station	C-20 thru C-60	P-1 thru P-n	L-1 thru L-3	HR	HE	HP	T						
TYPE OF SAMPLE	O	O	O										
Flow Rate (mgd)													
BOD, 5-day, 20° C, or COD (mg/l & kg/day)													
Chlorine Residual & Dosage (mg/l & kg/day)													
Settleable Matter (ml/1-hr. & cu. ft./day)													
Total Suspended Matter (mg/l & kg/day)													
Oil & Grease (mg/l & kg/day)													
Coliform (Total or Fecal) (MPN/100 ml) per req't													
Fish Toxicity, 96-hr. TL_{50} % Survival in undiluted waste													
Ammonia Nitrogen (mg/l & kg/day)													
Nitrate Nitrogen (mg/l & kg/day)													
Nitrite Nitrogen (mg/l & kg/day)													
Total Organic Nitrogen (mg/l & kg/day)													
Total Phosphate (mg/l & kg/day)													
Turbidity (Jackson Turbidity Units)													
pH (units)													
Dissolved Oxygen (mg/l and % Saturation)													
Temperature (°C)													
Apparent Color (color units)													
Secchi Disc (inches)													
Sulfides (if DO < 5.0 mg/l) Total & Dissolved (mg/l)													
Arsenic (mg/l & kg/day)													
Cadmium (mg/l & kg/day)													
Chromium, Total (mg/l & kg/day)													
Copper (mg/l & kg/day)													
Cyanide (mg/l & kg/day)													
Silver (mg/l & kg/day													
Lead (mg/l & kg/day)													

TABLE I (continued)
SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS

Sampling Station	C-20 thru C-60	P-1 thru P-n	L-1 thru L-3	HR	HE	HF	T						
TYPE OF SAMPLE	O	O	O										
Mercury (mg/l & kg/day)													
Nickel (mg/l & kg/day)													
Zinc (mg/l & kg/day)													
PHENOLIC COMPOUNDS (mg/l & kg/day)													
All Applicable Standard Observations	E	D	D										
Bottom Sediment Analyses and Observations													
Total Identifiable Chlorinated Hydrocarbons (mg/l & kg/day)													
Ammonia Nitrogen & Undissociated NH_4OH as Nitrogen (mg/l)													
TDS (mg/l)													
Gage Height (nearest $\frac{1}{10}$')				D	D	D							
Rainwater volume, (gal.)							D						

LEGEND FOR TABLE

TYPES OF SAMPLES

G = grab sample
C-24 = composite sample - 24-hour
Cont = continuous sampling
O = observation

TYPES OF STATIONS

E = waste effluent stations
C = receiving water stations
P = treatment facilities perimeter stations
L = basin and/or pond levee stations

FREQUENCY OF SAMPLING

E = each occurrence
D = once each day
W = once each week
M = once each month
Q = once each quarter
Y = once each year
2/Y = once in March and once in September
Cont = continuous

NOTES FOR TABLE I

Note
No.

1. Separately collect and analyze 3 grab samples for oil and grease on each sampling day. Report the average concentration as the mg/l for that day, and use that average to calculate kg/day discharge rate.

2. Collect storm water samples during the first and second storms of each month, taking a minimum of 3 grab samples on the first day of the storm. The first such grab shall be taken during the first hour of runoff resulting from the storm, and the others at equal time intervals thereafter. Handle data in accord with Note 1, but omit pounds per-day calculations.

3. Collect 3 grab samples as indicated by Note 2. Combine them before analysis, to determine the concentration for that day.

4. Sample Stations C-3, -4, -6, and -7 only.